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FRESH-WATER OSTRACODA FROM BRAZIL [1]

By Willis L. Tressler

Very little is known of the ostracod fauna of Brazil, and still less work has been done on the Ostracoda of the region around São Paulo. Sars (1901) reported on several species from this latter region; Daday (1911) described a new species of *Cypris* from Brazil; more recently Klie has published several papers on the ostracods of northeastern Brazil (1939, 1940); and I have in preparation a publication on some ostracods from the region of Santarém, in northern Brazil. These are the only publications on the Ostracoda of Brazil.

Most of the forms reported on in the present paper are typically American. The genera *Chlamydotheca*, *Physocypria*, and *Strandesia* have not been found outside North or South America. Of the 22 species described several have been reported previously from South America. *Chlamydotheca incisa* is known from Argentina, *Strandesia bicuspis bicuspis* from Argentina, Paraguay, and Brazil, and *Cypretta costata* from Brazil as well as Madagascar. The well-known forms *Chlamydotheca unispinosa* and *Stenocypris malcolmsoni* are widely distributed. The former is known from Brazil (Pernambuco), the Hawaiian Islands, Jamaica, Yucatán, Illinois, Ohio, Louisiana, and Maryland, while the latter has been reported from such widely separated regions as India, Ceylon, Australia, Celebes, Sumatra, East Africa, Yucatán, the Philippines, and Hawaii. *Chlamydotheca arcuata* is known from Ohio, Florida, Mexico, and Brazil (Itatiba). *Cypricercus episphaena* was known only from South Africa previous to this report. Two forms, *Physocypria crenulata* and *Cyprinotus ovatus*, were known previously only from Sumatra. The striking genus *Pelocypris*, with its one known species, *P. lenzi*, has been reported only

[1] A contribution from the Zoology Department of the University of Maryland.

from the state of Paraíba, Brazil (Klie, 1939, p. 85), a region not far distant from the localities of the present collection.

The material for this paper was collected in 1937 in northeastern Brazil by Dr. Stillman Wright, of the United States Fish and Wildlife Service, and by Dr. Herm. Kleerekoper, of the University of Michigan, in 1940, 1941, and 1942, in southern Brazil, in the region of São Paulo. The report includes 22 species belonging to 9 genera, of which 12 appear to be new species. The alcoholic samples containing the specimens and the slides of dissected specimens from which the descriptions were made have been deposited in the United States National Museum as type specimens.

Family CYPRIDAE

Subfamily CANDONINAE

Bottom forms without powers of swimming. Natatory setae of second antennae poorly developed or even entirely lacking. Last joint of second leg cylindrical. Furca well developed, the dorsal border with one or two setae; if only one seta is present it is located at a considerable distance from the base of the subterminal claw. Ductus ejaculatorius with five or six whorls of radiating spines.

Genus PHYSOCYPRIA Vávra

Physocypria VÁVRA, Süsswasser-Ostracoden Deutsch-Ost-Afrikas, vol. 4, p. 7, 1897.
Cypria SHARPE (part), Bull. Illinois State Lab. Nat. Hist., vol. 4, p. 459, 1898.
Cypria (*Physocypria*) SHARPE, Proc. U. S. Nat. Mus., vol. 26, p. 994, 1903.

Valves always unequal and compressed, the margin of either right or left valve more or less tuberculated. Natatory setae of the second antennae well developed and extending considerably beyond the tips of the terminal claws. Terminal segment of second thoracic leg rather short, with two long and one short setae.

PHYSOCYPRIA CRENULATA (Sars)

FIGURE 12, *a*

Cypria crenulata SARS, Arch. Naturv. Christiania, vol. 25, No. 8, p. 32, 1903.
Physocypria crenulata G. W. MÜLLER, Das Tierreich, vol. 31, p. 133, 1912.

Specific characters.—FEMALE: Shell compressed laterally, height about three-fifths the length and highest just posterior to the middle. Both extremities rounded, the posterior end somewhat more broadly rounded than the anterior. On the dorsal border there is a slight concavity immediately over the eye. Ventral border concave. Right valve crenated both anteriorly and posteriorly; crenulations more extensive on posterior border. Left valve not crenulated. Furca notably bent, the dorsal seta about one-third the length of the

dorsal border and located in the distal half of the furca. Length 0.65 mm; height 0.36 mm.

MALE: Unknown.

Material examined.—Numerous specimens of this species were found in several localities. A pool, Primavera, 28 kilometers west of Fortaleza, Ceará (October); Lagoa Parangaba, near Fortaleza (May); roadside pool, Sobral, Ceará (October); pool at Jatoba, Pernambuco (March); Acude Morada Bonita, near Lavras, Ceará; Acude Grande near Maranguape, Ceará (November); Acude Serrote near Maranguape, Ceará (May); Acude Marizinho, Lavras, Ceará (August); pool, Sobral Ceará.

Recorded distribution.—Sumatra (Sars, 1903).

Subfamily CYPRINAE

Valves commonly pigmented with occasional marginal tubercles or crenulations. Second antennae with natatory setae usually not reaching beyond tips of the terminal claws. Third maxillary process with one or two or sometimes all setae spinelike and either toothed or smooth. Second thoracic leg with a beaklike terminal claw and a long reflexed seta. Furcal ramus well developed, with two claws and two setae or rudimentary.

Genus PELOCYPRIS Klie

Pelocypris KLIE, Zool. Anz., vol. 128, p. 85, 1939.

Shell of firm consistency with numerous long, heavy, blunted spines on the anterior and posterior borders. Height about half the length. Rather broad forms when viewed from above. Surface of valves with an intricate pattern of small brownish spots. Second antennae with well-developed natatory setae which extend considerably beyond the tips of the terminal claws. First thoracic leg with a long curved terminal claw. Second leg with one short and one long seta. Furca well developed with the dorsal seta longer than the subterminal claw.

Remarks.—This striking genus was first described by Klie from northeastern Brazil. Its characteristics are very similar in many ways to those of *Ilyocypris*, but the presence of heavy spines on the valves and the entirely different second thoracic leg show clearly that it belongs to a different genus.

PELOCYPRIS LENZI Klie

FIGURE 12, *b–i*

Pelocypris lenzi KLIE, Zool. Anz., vol. 128, p. 85, 1939.

Specific characters.—FEMALE: Shell of firm consistency with moderately wide inner duplicatures. Viewed from the side, height equal to

about half the length of the valve. Both extremities broadly rounded, the posterior end somewhat more broadly rounded than the anterior. Highest well anterior to the middle. On the dorsal margin posterior to the highest point there is a well-marked infolding. Dorsal margin gently sloping from highest point to posterior rounded portion. Ventral border almost flat with only a slight concavity at the midpoint. On the anterior and posterior borders of both valves are eight or nine very long heavy spines with blunted ends from which a hair extends. Surface of valves covered with a series of rounded, brownish spots. Left valve distinctly larger than the right on all margins. First antennae with a long narrow terminal joint. Second antennae with well-developed natatory setae which reach beyond the tips of the terminal claws by about one-third the length of the setae. Terminal claws heavy and toothed in their distal portion. First leg, large with a long curved terminal claw. Subterminal segment distinctly divided. Second leg with a curved beaklike terminal claw and a long reflexed seta. Furca well developed and slightly curved. Terminal seta about one-fourth the length of terminal claw. Subterminal claw two-thirds the length of the terminal claw. Both claws finely toothed on their distal portions. Dorsal seta heavy and located about twice the width of the ramus from the base of the subterminal claw. Length of dorsal seta slightly longer than that of the subterminal claw and haired in its distal portion. Length 1.92 mm.; height 1.05 mm.

MALE: Smaller than the female. Height about one-half the length, highest in front of the middle, where the dorsal border forms a distinct corner. From the highest point the dorsal margin slopes in an almost straight line to the posterior end, where a more or less distinct angle is formed. The two dorsal folds at about the middle of the dorsal side are well marked. Ventral border almost flat with a slight concavity. Anterior margin more rounded than posterior; both ends heavily crenulated in addition to bearing spines as in the female. Spines are not as numerous as in the female. Seminiferous tubules very prominent and forming a dense whorl in the posterior part of the shell. Length 1.40 mm; height 0.77 mm. (The considerable difference in the size of the male and female taken in this collection leads to the belief that the males were not fully matured. In Dr. Klie's specimens there was only a slight disparity of size between the sexes.)

Material examined.—Eleven mature specimens were collected by Dr. Wright from Lagoa Precabura, near Mecejana, Ceará (May). One immature specimen was also found in a pool at Primavera, 28 kilometers west of Fortaleza (October).

Recorded distribution.—Acude Piaba in the state of Paraíba, Brazil (Klie, 1939a).

Remarks.—This is a large clearly defined form and easily recognized. It bears a close resemblance superficially to *Ilyocypris* and indeed might easily be mistaken for this form. The presence of the well-

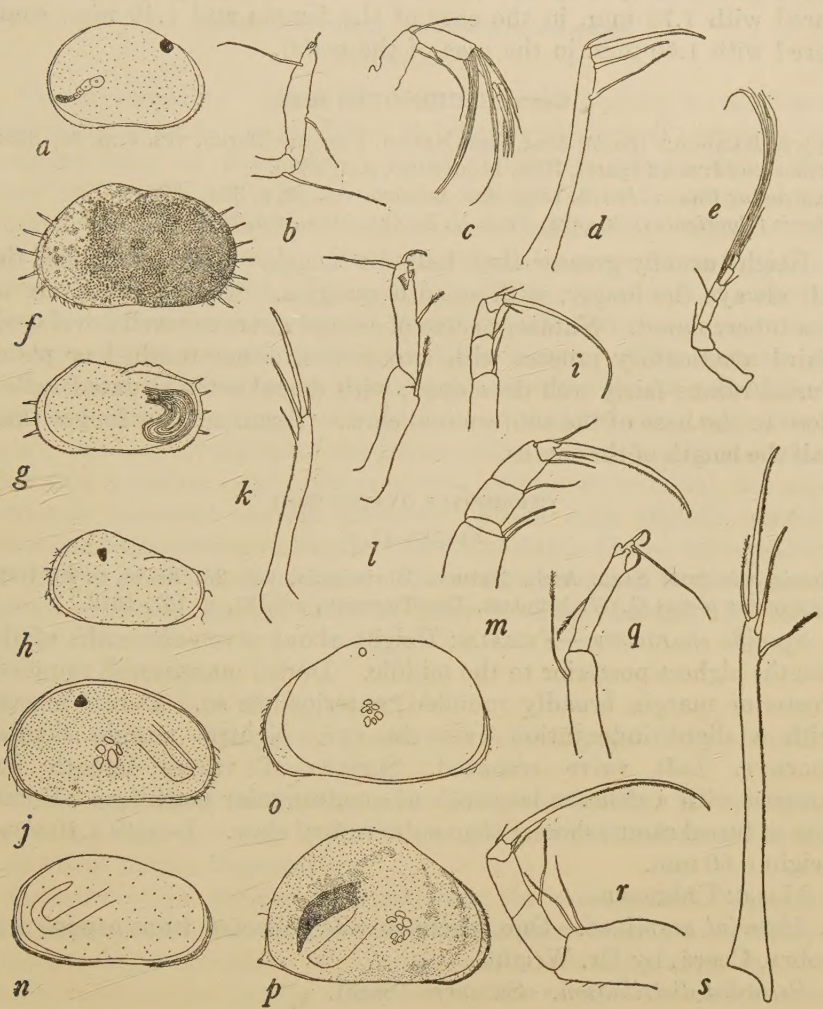

FIGURE 12.—PHYSOCYPRIA, PELOCYPRIS, CHLAMYDOTHECA, and CYPRINOTUS

a, *Physocypria crenulata* (Sars): Right valve of female.

b–i, *Pelocypris lenzi* Klie: *b*, Second leg of female; *c*, second antenna of female; *d*, furca of female; *e*, first antenna of female; *f*, left valve of female; *g*, right valve of male; *h*, immature female; *i*, first leg of female.

j–m, *Chlamydotheca alegrensis*, new species: *j*, Left valve of female; *k*, furca of female; *l*, second leg of female; *m*, first leg of female.

n, *Cyprinotus ovatus* (Sars): Right valve of female.

o–s, *Chlamydothec akleerekoperi*, new species: *o*, Left valve of female; *p*, right valve of female; *q*, second leg of female; *r*, first leg of female; *s*, furca of female.

formed spines and the structure of the second leg clearly separate it from *Ilyocypris*. The present specimens agree in every respect with those described by Dr. Klie (1939) except in size (1.92 mm. as compared with 1.75 mm. in the case of the female and 1.40 mm. compared with 1.60 mm. in the case of the male).

Genus CYPRINOTUS Brady

Cypris Ramdohr (part), Mag. Ges. Naturf. Freunde Berlin, vol. 2, p. 84, 1808
Monoculus Jurine (part), Hist. Monocules, p. 1, 1820.
Cyprinotus Brady, Journ. Linn. Soc. London, vol. 19, p. 301, 1885.
Cypris (Cyprinotus) Sharpe, Proc. U. S. Nat. Mus., vol. 26, p. 989, 1903.

Height usually greater than half the length. Valves unequal, the left always the longer, with smooth margins. Right valve more or less tuberculated. Natatory setae of second antennae well developed. Third masticatory process with two spines, either toothed or plain. Furcal ramus fairly well developed, with dorsal setae situated rather close to the base of the subterminal claw. Terminal claw longer than half the length of the ramus.

CYPRINOTUS OVATUS (Sars)

Figure 12, *n*

Hemicypris ovata Sars, Arch. Naturv. Christiania, vol. 25, No. 8, p. 26, 1903.
Cyprinotus ovatus G. W. Müller, Das Tierreich, vol. 31, p. 167, 1912.

Specific characters.—Female: Height about seven-elevenths of the length; highest posterior to the middle. Dorsal margin well rounded. Posterior margin broadly rounded; anterior less so. Dorsal margin with a slight indentation over the eye. Ventral margin slightly concave. Left valve crenated. Surface of valves smooth but covered with a delicate lacework of quadrangular markings. Dorsal seta of furcal ramus shorter than subterminal claw. Length 1.10 mm.; height 0.60 mm.

Male: Unknown.

Material examined.—One specimen was collected from a pool near Sobra, Ceará, by Dr. Wright.

Recorded distribution.—Sumatra (Sars).

Genus CHLAMYDOTHECA Saussure

Chlamydotheca (subg.) Saussure, Mém. Soc. Genève, vol. 14, p. 487, 1858.
Chlamydotheca Vávra, Ergebn. Hamburger Magalhaens. Sammelr., vol. 2, Ostracoda, p. 16, 1898.
Cypris Sars (part), Arch. Naturv. Christiania, vol. 24, No. 1, p. 20, 1901.

One or both valves with flangelike projections at each extremity. Well-developed natatory setae on second antennae. Third masticatory process of maxilla with one toothed spine and two smooth ones. Second segment of first leg with two well-developed setae on inner

distal margin. Furca with pectinated dorsal margin. Mainly large forms, easily distinguished. Restricted to North and South America, as far as is known.

CHLAMYDOTHECA ALEGRENSIS, new species

FIGURE 12, *j-m*

Specific characters.—FEMALE: Dorsal margin broadly rounded and highest anterior to the middle. Both extremities well rounded, the anterior more so than the posterior. Ventral margin flat. Eye large and prominent. Posteroventral margin of both valves with a number of toothlike spines, which become progressively larger toward the posteroventral corner. Surface of the valves smooth and sparsely covered with fine hairs. Flanges only slightly produced at anterior margin. Second antennae with natatory setae which do not reach the tips of the terminal claws by a slight margin. First thoracic leg with typical double setae on second segment and a heavy, rather short terminal claw. Terminal setae at base of terminal claw, well developed. Second leg, typical of the genus, with a curved beaklike terminal claw and a heavy, short, recurved seta. Setae on terminal and subterminal segments heavily plumose. Furca only slightly curved. Terminal seta one-fourth length of terminal claw. Dorsal seta one-half the length of subterminal claw. Claws finely toothed in their distal portions. Dorsal margin of furca finely toothed. Length 1.72 mm.; height 1.02 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83027.

Type locality.—Temporary pools near Porto Alegre, Rio Grande do Sul, collected by Dr. Kleerekoper.

Three additional specimens, also collected by Dr. Kleerekoper, are from a reservoir near Porto Alegre (September) and on grassland near Porto Alegre (September).

Remarks.—This species does not show the well-marked flanges at posterior and anterior margins so characteristic of the genus. There is only a slight indication of a flange on the anterior margin but the double setae on the first leg and the structure of the other parts leave no doubt as to the identity of the genus.

CHLAMYDOTHECA INCISA (Claus)

FIGURE 13, *l*

Pachycypris incisa CLAUS, Arb. Inst. Wien, vol. 10, p. 205, 1892.
Cypris labiata SARS, Arch. Naturv. Christiania, vol. 24, No. 1, p. 20, 1901.
Chlamydotheca incisa G. W. MÜLLER, Das Tierreich, vol. 31, p. 184, 1912.

Specific characters.—FEMALE: Height greater than half the length. Highest in the middle. Dorsal margin broadly rounded. Both extremities broadly rounded, the anterior extremity of both valves

with a prominent flange ending at the anterior end of the ventral margin in a small well-marked incisure. Ventral margin slightly convex. Surface of valves smooth and sparsely covered with hairs. Width greater than half the length when seen from above. Anterior end slightly pointed, posterior end rounded from above. Furca almost straight with rather weakly developed claws, which are slightly bent. The length of the terminal claw is about equal to half that of the dorsal margin of the ramus. The subterminal claw is about half the length of the terminal. Terminal seta one-fourth the length of terminal claw. Length 2.68 mm.; height 1.66 mm.

MALE: Unknown.

Material examined.—A large number of females of this species were found in a collection from a reservoir near Porto Alegre (May) by Dr. Kleerekoper.

Reported distribution.—Argentina (Sars, 1901).

CHLAMYDOTHECA UNISPINOSA (Baird)

FIGURE 13, *j*

Cypris unispinosa BAIRD, Ann. Mag. Nat. Hist., ser. 3, vol. 10, p. 3, 1862.
Cypris perelegans HERRICK, Mem. Denison Sci. Assoc., vol. 1, No. 1, p. 27, 1887.
Chlamydotheca unispinosa FURTOS, Carnegie Inst. Washington Publ. No. 457, p. 96, 1936.

Specific characters—FEMALE: Elongated, with dorsal and ventral margins nearly parallel. Height almost half the length; highest in posterior region. Both extremities broadly rounded, the posterior more so than the anterior. Anterior end of each valve with a moderately developed flange. Right valve with a spinelike protuberance at the posterior ventral corner of the posterior flange. Natatory setae of the second antennae do not extend to the tips of the terminal claws. Terminal claw of second leg stout, curved, and smooth. Furcal ramus straight and rather slender. Dorsal margin with four series of short hairs. Dorsal seta two-thirds as long as subterminal claw and removed from the base of the subterminal claw by twice the thickness of the ramus. Terminal seta two-sevenths the length of the terminal claw. Subterminal claw much smaller than the terminal. Length 4.80 mm.; height 2.30 mm.

MALE: Smaller than the female but otherwise similar. (No males were found in these collections but they are well known from other regions.)

Material examined.—One female was found in a collection made by Dr. Kleerekoper (October) from a lakelet in the state of Rio de Janeiro.

Recorded distribution.—Brazil (Klie, 1939); "Sandwich Islands" (Baird, 1862); Jamaica (Herrick, 1887); Yucatán (Furtos, 1936); Illinois (Evenson, 1942); Ohio (Hoff, 1944); Louisiana, Maryland (Tressler, 1947).

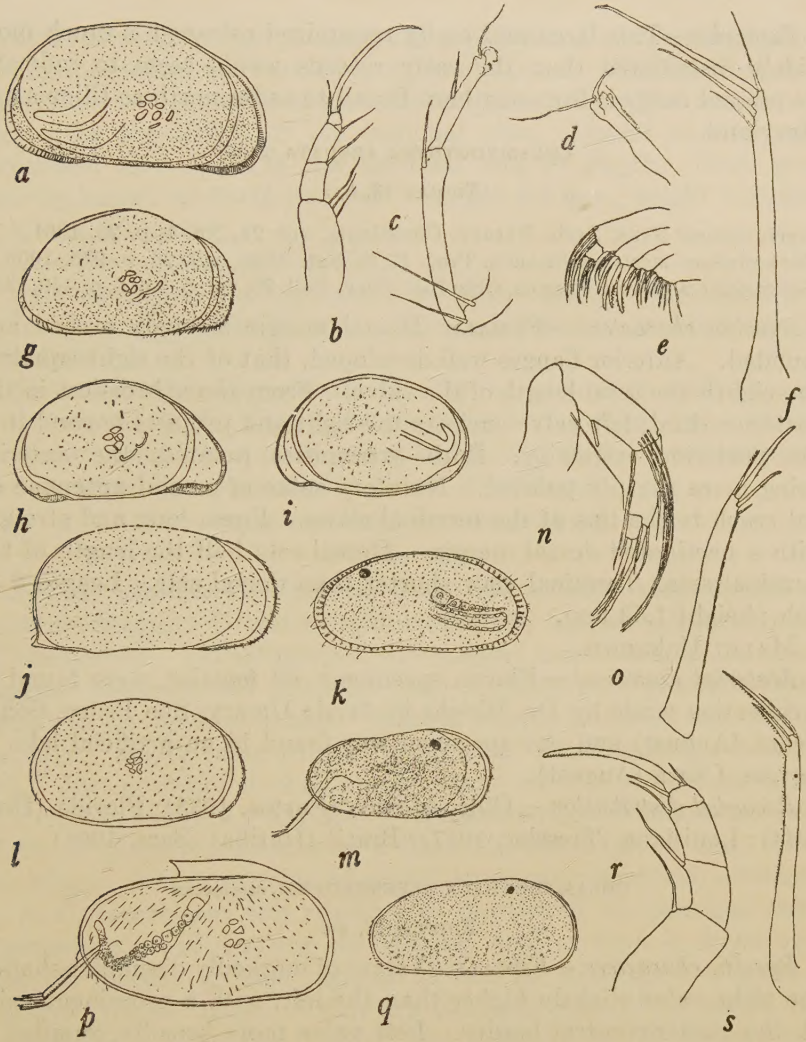

FIGURE 13.—CHLAMYDOTHECA, STENOCYPRIS, HERPETOCYPRIS, and STRANDESIA

a–c, *Chlamydotheca wrighti*, new species: *a*, Right valve of female; *b*, first leg of female; *c*, second leg of female.

d–g, *C. braziliensis*, new species: *d*, Second leg of female; *e*, masticatory process of maxilla of female; *f*, furca of female; *g*, right valve of female.

h, *i*, *C. arcuata* (Sars): *h*, Right valve of female; *i*, left valve of female.

j, *C. unispinosa* (Baird): Right valve of female.

k, *Stenocypris malcolmsoni* (Brady): Left valve of female.

l, *Chlamydotheca incisa* (Claus): Right valve of female.

m, *o*, *Herpetocypris muhitis*, new species: *m*, Right valve of female; *n*, second antenna of female; *o*, furca of female.

p, *Strandesia bicuspis bicuspis* (Claus): Whole animal from right, female.

q–s, *Strandesia denticulata*, new species: *q*, Right valve of female; *r*, first leg of female; *s*, furca of female.

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Remarks.—This large and easily recognized ostracod is much more widely distributed than the early records would seem to indicate. Its present range is from southern Brazil to as far north as Illinois and Maryland.

CHLAMYDOTHECA ARCUATA (Sars)

FIGURE 13, *h*, *i*

Cypris arcuata SARS, Arch. Naturv. Christiania, vol. 24, No. 1, p. 23, 1901.
Chlamydotheca mexicana SHARPE, Proc. U. S. Nat. Mus., vol. 26, p. 976, 1903.
Chlamydotheca arcuata FURTOS, Ohio Biol. Surv. Bull. 29, vol. 5, No. 6, p. 440, 1933.

Specific characters.—FEMALE: Dorsal margin strongly arched and rounded. Anterior flanges well developed, that of the right equaling one-eighth the total length of the valve. From above broadest in the posterior third; left valve encloses the right and projects beyond it at the posterior extremity. Both extremities pointed, the anterior being more sharply pointed. Natatory setae of second antennae do not reach to the tips of the terminal claws. Furca long and straight with a pectinated dorsal margin. Dorsal seta half the length of the terminal seta. Terminal claw shorter than dorsal seta. Length 2.68 mm.; height 1.53 mm.

MALE: Unknown.

Material examined.—Eleven specimens, all females, were found in a collection made by Dr. Wright in Acude Umary, São Pedro, South Ceará (August) and one specimen was found in an artificial lake at Lavras, Ceará (August).

Recorded distribution.—Ohio, Mexico (Furtos, 1933); Florida (Hoff, 1944); Louisiana (Tressler, 1947); Brazil (Itatiba) (Sars, 1901).

CHLAMYDOTHECA KLEEREKOPERI, new species

FIGURE 12, *o-s*

Specific characters.—FEMALE: Valves of markedly dissimilar shapes; the right valve slightly higher than the left, with a prominent spine at the posteroventral border. Left valve more broadly rounded in the anterior end and flattened on the dorsal margin. Right valve highest in the posterior half with a slightly flattened mid portion, which forms an angle just anterior to the center and then slopes steeply toward the anterior end. Posterior margin broadly rounded; ventral margin nearly straight. Left valve with a broadly rounded posterior margin; ventral margin convex. Inner duplicatures well developed in both shells, the anterior duplicature larger than the posterior. Valves smooth and very sparsely haired. Natatory setae of second antennae well developed and barely reaching the tips of the terminal claws. First leg with well-developed terminal claw and definitely divided third segment. Second leg with a very much recurved terminal beak and a long reflexed seta. Furca long and

straight and finely haired along its dorsal margin. Terminal claws strong and delicately toothed in their distal half. Subterminal claw three-fourths the length of the terminal claw. Terminal seta seven-sixteenths the length of the terminal claw. Dorsal seta strongly developed and equal to the terminal seta in length. Both setae heavily haired on distal portions. Length 4.6 mm.; height 2.95 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83013.

Type locality.—The type and nine other females were found in a collection made by Dr. Wright in the Acude Serrote near Maranguape. Ceará (May).

Remarks.—This large ostracod may be identified easily by the shape of the shell. *Chlamydotheca unispinosa,* which has a similar posterior spine, has a much lower and flatter shell. I take pleasure in dedicating this species to Dr. Herm. Kleerekoper.

CHLAMYDOTHECA WRIGHTI, new species

FIGURE 13, *a-c*

Specific characters.—FEMALE: Both valves with very prominent anterior flanges. Dorsal margin arched and highest a little anterior to the middle. Dorsal margin with a slight indentation in the ocular region. Anterior and posterior ends rounded with prominent pore canals in the hyaline border. Ventral margin flattened and slightly concave. Right valve with a much wider anterior flange than the left. Just posterior to the anterior flange there is a slight indication of a shallow incisure. Surface of valves smooth with almost no hairs. Color of preserved specimens a beautiful bluish green with brown markings. Natatory setae of second antennae not as well developed as in *C. kleerekoperi* and reaching to the tips of the terminal claws. Terminal claw of first leg considerably shorter than in *kleerekoperi* and not haired. Second segment of first leg with the two setae on its inner distal margin, which are characteristic of the genus, and in addition a third seta located just posterior to the regular pair. Third seta slightly shorter than the posterior seta of the regular pair. Second leg with a shorter reflexed seta and a more curved terminal beak than in *kleerekoperi.* Terminal beak recurves in an almost complete circle. Furca similar to that of *kleerekoperi.* Terminal bristle two-sevenths the length of the terminal claw. Dorsal margin with a series of five groups of fine hairs. Length 3.19 mm.; height 1.75 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83010.

Type locality.—The type and two other females were taken from Acude Umary, São Pedro, southern Ceará, by Dr. Wright (August).

Remarks.—This species may be identified readily by the shape of

the shell, which is markedly different from *C. arcuata*, and by the extra bristle on the second segment of the first leg. It is a pleasure to dedicate this form to my old friend Dr. Stillman Wright.

CHLAMYDOTHECA BRAZILIENSIS, new species

FIGURE 13, *d-g*

Specific characters—FEMALE: Both valves similar in shape, with moderately developed anterior flanges. Dorsal margin arched, highest slightly anterior to the center. A slight indentation appears in the ocular region. Anterior end more broadly rounded than posterior. Ventral margin slightly convex in the center. Surfaces of valves smooth and finely haired. Hyaline border and pore canals lacking. Antennae characteristic of the genus. First leg with a moderately developed terminal claw. Second leg with the terminal beak almost straight. Masticatory process of the maxilla with two smooth and two heavily toothed spines. Furca well developed, with the terminal claw equal in length to about two-thirds the length of the dorsal margin of the furca. Subterminal claw slightly more than half the length of the terminal claw. Both claws haired in their distal halves. Terminal seta equal to not quite half the length of the terminal claw. Dorsal seta shorter than terminal seta and equal to one-half the length of the subterminal claw. Length 4.46 mm.; height 2.55 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83012.

Type locality.—One female was taken from a collection made in an artificial lake near Lavras, Ceará, by Dr. Wright (August). Holotype, U.S.N.M. No. 83012.

Genus STENOCYPRIS Sars

Stenocypris SARS (part), Forh. Selsk. Christiania, 1889, No. 8, p. 27, 1890.
Stenocypris sensu stricto VÁVRA, Jahrb. Hamburg. Wiss. Anst., vol. 12, p. 4, 1894.

Valves elongated, height usually not greater than half the length. Natatory setae of second antennae extend to about the tips of the terminal claws. Third masticatory process of maxilla with two spines. Furca asymmetrical, with dorsal margin heavily denticulated in one member. Dorsal seta usually absent. Both claws heavily toothed in each furca.

STENOCYPRIS MALCOLMSONI (Brady)

FIGURE 13, *k*

Cypris cylindrica BAIRD, Proc. Zool. Soc. London, vol. 27, p. 233, 1859.
Cypris malcolmsoni BRADY, Journ. Linn. Soc. London, vol. 19, 297, 1886.
Stenocypris malcolmsoni SARS, Forh. Selsk. Christiania, 1889, No. 8, p. 28, 1890.

Specific characters.—Female: Elongated forms with evenly arched dorsal margin and almost flat ventral margin, which is only slightly sinuated. Both ends about equally rounded. Submarginal line widely removed from the free margins. Pore canals very prominent and forming a wide band at both ends and to a lesser extent on dorsal and ventral margins. From above, compressed with left valve slightly longer than right and projecting anteriorly in front of right valve. Margins of valves quite hairy. Natatory setae of second antennae reach to the tips of the terminal claws. Spines of third masticatory process of maxilla moderately toothed. Second leg with a curved terminal claw, which is equal to about one-third the length of the penultimate segment. Furca long and narrow. Posterior half of dorsal margin armed with heavy teeth in one member. In the other furca much smaller teeth are found in the distal ninth of the ramus. Claws strong, very unequal and armed with heavy teeth, Terminal claw less than one-half the length of the ramus; terminal seta almost as long as the terminal claw. Length 1.23 mm.; height 0.50 mm.

Male: Unknown.

Material examined.—Thirteen specimens were collected by Dr. Kleerekoper from a reservoir in Campinas, São Paulo (March).

Recorded distribution.—India (Baird, 1859); Ceylon (Brady, 1886, and Daday, 1898); Australia (Sars): Celebes, Sumatra, and East Africa (Müller, 1912); Yucatán (Furtos, 1936); Philippines, Celebes, Hawaii (Tressler, 1937).

Genus HERPETOCYPRIS Brady and Norman

Cypris Baird (part), Hist. Berwick Club, vol. 1, p. 98, 1835.
Erpetocypris Brady and Norman (part), Trans. Royal Dublin Soc., ser. 2, vol. 4, p. 84, 1889.
Herpetocypris Sars, Forh. Selsk. Christiania, 1889, No. 8, p. 34, 1890.

Shells elongate with height usually less than half the length. Surface of valves with scattered puncta between which occur, with one or two exceptions, numerous smaller puncta. Third masticatory process of maxilla with two strong spines. Furca strongly developed, with two claws and two setae. Dorsal seta located less than the width of the ramus from the subterminal claw. Terminal claw much less than one-half the length of the ramus.

HERPETOCYPRIS MUHITIS, new species

Figure 13, *m-o*

Specific characters.—Female: Height about one-half the length and highest in the anterior third. Dorsal margin slightly concave and sloping from the anterior highest point in ocular region to the posterior margin. Ventral margin slightly convex. Both ends rounded, the anterior end more broadly than the posterior. Inner duplicature in

anterior end well developed. Surface of valves covered with the puncta characteristic of the genus. Natatory setae of second antennae reach to tips of terminal claws. Spines of third masticatory process of maxilla smooth. Remainder of appendages are normal for the genus. Furca equally armed. Dorsal margin with a series of five groups of teeth. Terminal seta equal to five-eighths the length of the terminal claw. Dorsal seta very short and situated the width of the base of the subterminal claw from the subterminal claw. Subterminal claw curved at end. Length 1.55 mm.; height 0.75 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83033.

Type locality.—The type, a female, was taken by Dr. Kleerekoper, with another specimen, from a lake near the Mogy Guassu River (August). An additional specimen was taken by Dr. Kleerekoper from a reservoir near Porto Alegre, Rio Grande do Sul (September).

Genus STRANDESIA Stuhlman

Strandesia STUHLMAN, Sitz. Ber. Akad. Berlin, p. 1260, 1888.
Acanthocypris CLAUS, Arb. Inst. Wien, vol. 10, p. 196, 1892.
Neocypris SARS, Arch. Naturv. Christiania, vol. 24, No. 1, p. 29, 1901.
Strandesia G. W. MÜLLER (part), Das Tierreich, vol. 31, 1912.

Shell elongated and moderately plump. Right valve often with a prominent dorsal flange. Left valve with a row of tuberclelike canals removed from the free margins. Natatory setae of second antennae reach to tips of terminal claws. Furca powerfully developed and equal to at least half the length of the valves. Two claws and two setae. Dorsal seta less than the width of the ramus from the base of the subterminal claw.

STRANDESIA BICUSPIS BICUSPIS (Claus)

FIGURE 13, *p*

Acanthocypris bicuspis CLAUS, Arb. Inst. Wien, vol. 10, p. 199, 1892.
Neocypris gladiator SARS, Arch. Naturv. Christiania, vol. 24, No. 1, p. 29, 1901.
Eucypris bicuspis DADAY, Untersuchungen über die Süsswasser-Mikrofauna Paraguys: Zool., vol. 18, pt. 44, p. 243, 1905.
Strandesia bicuspis bicuspis MÜLLER, Das Tierreich, vol. 31, p. 187, 1912.

Specific characters.—FEMALE: Valves dissimilar, right valve with a prominent dorsal flange, which is drawn out to a point in the dorsal third of the valve. Height (including flange) equal to three-fifths the length; highest in the middle. Left valve lacking the dorsal flange and with dorsal and ventral margins nearly parallel. Ends of both valves broadly rounded. Surface of valves sparsely hairy. Both spines of third masticatory process of maxilla heavily toothed. Terminal claw of second leg strong, slightly bent and toothed. Furcal ramus straight and twenty times longer than narrowest width of ramus. Dorsal margin with seven groups of well-developed teeth.

Dorsal seta very short; claws very unequal and both heavily armed with teeth. Terminal claw slightly longer than one-third the length of the ramus. Terminal seta reaching almost to tip of terminal claw. Length 1.90 mm.; height 1.02 mm.

MALE: Unknown.

Material examined.—Nine specimens were found in temporary pools on grassland near Porto Alegre (January) by Dr. Kleerekoper. Several specimens were also found by Dr. Kleerekoper in temporary backwater in pools in the river Tiete near São Paulo City (March, February, November).

Recorded distribution.—Argentina (Claus, 1892); Brazil (Sars, 1901); northern Brazil (Tressler, unpublished); Paraguay (Daday, 1905); Yucatán (Furtos, 1936).

Remarks.—This easily recognized species is apparently confined to South and Central America.

STRANDESIA DENTICULATA, new species

FIGURES 13, *q-s*; 14, *c*

Specific characters.—FEMALE: Height slightly greater than half the length and highest in anterior third. Dorsal margin straight and sloping from highest point in ocular region to posterior extremity. Ventral margin straight. Both ends broadly rounded, anterior end more broadly rounded than posterior. Posterior extremity of both valves armed with a series of sharp spines or serrations. Left valve serrations more strongly developed than those of right. Natatory setae of second antennae reach almost to tips of terminal claws. First leg short and heavy with a short thick terminal claw. Spines on inner margins of second and third joints very well developed but unhaired. The third segment is distinctly divided. Second leg with a heavy, curved, and toothed terminal beak and a reflexed seta, which is greatly enlarged at its proximal end. A short, heavy, recurved seta is located on the subterminal segment. Spines on third masticatory process of maxilla are heavily toothed. Furca equal to five-eighths the length of the valve. Terminal seta four-sevenths length of terminal claw. Dorsal margin with four groups of subequal teeth and a fifth partially developed group. Dorsal seta very short and situated the width of the basal portion of the subterminal claw from the subterminal claw. Claws both heavily toothed. Length 1.40 mm.; height 0.76 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83032.

Type locality.—Five specimens were collected by Dr. Kleerekoper in a reservoir near Porto Alegre (July). In addition to the specimens from the type locality nine others were obtained from pools on grass-

land near Porto Alegre (September) and numerous specimens were found in pools in the River Tiete, near the city of São Paulo (November, March, July, February).

STRANDESIA TIETENSIS, new species

FIGURE 14, *d, e, g, h*

Specific characters.—FEMALE: Height about half the length and highest in posterior third. Dorsal margin arched, ventral margin nearly flat. Both extremities broadly rounded. Ventral margin with a narrow hyaline border without visible pore canals. Surface of valves covered in posterior and ventral portions by a series of fine reticulations. Natatory setae of second antennae reach to tips of terminal claws. Spines of third masticatory process of maxilla heavily toothed. First leg more slender than in *S. denticulata* and with a longer though equally heavy claw. Spine on inner margin of divided third segment unusually well developed. Second leg with a heavy, curved, and denticulate beaklike terminal claw and a long reflexed seta. Two recurved shorter setae extend from the base of the claw. Furca long and slender and equaling nine-fifteenths the length of the valves. Terminal seta eight-ninths the length of terminal claw. Subterminal claw about two-thirds the length of terminal claw. Both claws well armed. Dorsal seta short and haired. Dorsal margin of ramus finely haired throughout its distal third. Length 1.49 mm; height 0.72 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83031.

Type locality.—One specimen was found in a collection made by Dr. Kleerekoper from temporary backwater pools of the River Tiete near the city of São Paulo (July).

STRANDESIA RIOGRANDENSIS, new species

FIGURE 14, *a, b, f*

Specific characters.—FEMALE: Height slightly greater than half the length and highest in posterior third. Dorsal margin highly arched. Both extremities broadly rounded. The posterior extremity has a forward-sloping posteroventral margin. Valves very thin and sparsely haired. From above, left valve overlaps right valve in front. Ventral margin convex. Natatory setae of second antennae reach to tips of terminal claws. Spines on third masticatory process of maxilla are toothed. First leg similar to that of *S. tietensis*. Second leg also similar to that of *tietensis*. Furca four-sevenths the length of the valves. Terminal seta slightly less than two-thirds the length of the terminal claw. Claws very much heavier than in *tietensis* and heavily armed with large, coarse teeth. Dorsal seta short and unhaired.

FIGURE 14.—STRANDESIA, CYPRICERCUS, and CYPRETTA

a, b, f, Strandesia riograndensis, new species: *a,* Left valve of female; *b,* spines on third masticatory process of maxilla of female; *f,* furca of female.

c, S. denticulata, new species: Second leg of female.

d, e, g, h, S. tietensis, new species: *d,* First leg of female; *e,* furca of female; *g,* right valve of female; *h,* second leg of female.

i–k, y, S. itapeva, new species: *i,* Right valve of female; *j,* second leg of female; *k,* first leg of female; *y,* furca of female.

l–o, S. ovalis, new species: *l,* Left valve of female; *m,* second leg of female; *n,* first leg of female; *o,* furca of female.

p–r, x, S. pedroensis, new species: *p,* Left valve of female; *q,* first leg of female; *r,* second leg of female; *x,* furca of female.

s, Cypricercus episphaena G. W. Müller: Left valve of female.

t–w, C. rotundus, new species: *t,* Left valve of female; *u,* first leg of female; *v,* second leg of female; *w,* furca of female.

z, Cypretta costata G. W. Müller: Dorsal view, female.

Dorsal margin of ramus with seven groups of subequal teeth. Length 1.42 mm.; height 0.77 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83030.

Type locality.—One specimen was found in a collection made by Dr. Kleerekoper from temporary pools on grassland near Porto Alegre (January).

STRANDESIA ITAPEVA, new species

FIGURE 14, *i–k, y*

Specific characters.—FEMALE: Height equal to about half the length' highest a little anterior to the middle. Dorsal margin arched. Both extremities rounded, anterior extremity more broadly rounded than posterior. Posterior end of right valve with a projecting flange. Ventral margin slightly indented in the middle. Natatory setae of second antennae overreach the tips of the terminal claws slightly. Masticatory spines very lightly toothed. First leg with a long, slender claw which is finely toothed on its distal third. Spines on inner margin of divided third segment well developed but unhaired. One short and two longer setae at base of terminal claw. Second leg with a heavy recurved beak which is undenticulated. Reflexed seta well developed and straight with a slight crook in its distal third. One short recurved seta at base of beak. Furca slightly less than half the length of the valves. Dorsal margin with four groups of subequal teeth. Dorsal seta short and located close to base of subterminal claw. Terminal seta slightly less than half the length of terminal claw. Both claws heavily armed with sharply pointed teeth. Length 1.20 mm.; height 0.63 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83029.

Type locality.—Twenty specimens were found in a collection made by Dr. Kleerekoper in the shore water of the Lagoa Itapeva, Rio Grande do Sul (July). Besides these specimens from the type locality, 3 were also collected by Dr. Kleerekoper from temporary pools on grassland near Porto Alegre (January).

STRANDESIA OVALIS, new species

FIGURE 14, *l–o*

Specific characters.—FEMALE: Broadly oval in shape, valves approximately equal. Height somewhat greater than half the length. Highest in the middle. Dorsal margin well rounded and sloping equally to well rounded posterior and anterior extremities. Extremities equally rounded. Ventral margin sinuated. Three long, coarse hairs extend from the posterior extremity. Natatory setae on second antennae reach to tips of terminal claws. First leg with a long, slender terminal claw finely toothed in its distal half. Spines on

inner margins of third divided segment heavily developed. Second leg with a curved, denticulated beak and a heavy, rather short reflexed seta. Spine on second joint heavily developed and haired. Furca very long and narrow. Terminal claws unusually short and equal to no more than one-fourth the length of the ramus. Terminal seta about seven-tenths the length of the terminal claw. Both claws heavily armed with coarse teeth. Dorsal seta somewhat longer than in *S. itapeva* and unhaired. On the dorsal margin are five groups of subequal hairs. Length 1.40 mm.; height 0.75 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83028.

Type locality.—One specimen was taken by Dr. Kleerekoper in temporary pools on grassland near Porto Alegre (January).

STRANDESIA PEDROENSIS, new species

FIGURE 14, *p–r, x*

Specific characters.—FEMALE: Height less than half the length and highest in posterior third of shell. Dorsal margin relatively flat with only a trace of convexity. Indentation in ocular region. Anterior extremity broadly rounded; posterior extremity sloping ventrally and produced in a blunt posteroventral projection. Ventral margin slightly concave. Valves smooth and very sparsely haired. Second antennae similar to those of *S. ovalis*. First leg with a short, stubby terminal claw. Next-to-last segment clearly divided. Bristles on inner margin well developed but not haired. Second leg with a heavy, slightly bent terminal beak, haired on its distal third. Furca rather short and heavily armed both on their dorsal margins and on the terminal claws. Dorsal seta located almost immediately at base of subterminal claw and separated from it by less than the width of the seta. Terminal seta four-fifths the length of the terminal claw. Both claws heavily armed throughout the greater part of their length. Length 1.33 mm.; height 0.56 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83008.

Type locality.—São Pedro, South Ceará. Eleven specimens were collected by Dr. Wright in the Acude Umary, São Pedro, South Ceará (August).

Remarks.—This species may be recognized easily by the shape of the shell and by the configuration of the furcal rami, particularly the position of the dorsal seta in relation to the base of the subterminal claw.

Genus CYPRICERCUS Sars

Cypricercus SARS, Skrift. Vid. Christiania, 1895, No. 8, p. 37, 1896.
Neocypris SARS, Arch. Naturv. Christiania, vol. 24, No. 1, p. 29, 1901.

Spirocypris SHARPE, Proc. U. S. Nat. Mus., vol. 26, p. 981, 1903.
Strandesia G. W. MÜLLER, Das Tierreich, vol. 31, p. 186, 1912.

Rather elongated valves, fairly tumid and higher in front than behind. Left valve projects slightly beyond right in front. Third masticatory process with two long well-developed spines. Furcal ramus long but not as long or as powerfully developed as in *Strandesia*. Furcal ramus equal to about one-third the length of the valves. Terminal claw not more than half the length of the ramus. Dorsal seta shorter than the terminal seta and removed from the subterminal claw by one or two times the width of the ramus.

Remarks.—G. W. Müller (1912) has lumped the two genera *Strandesia* and *Cypricercus* together in *Strandesia*. I am of the opinion held by Sars (1928) and Furtos (1933) that these two genera should be kept separate. While closely related, they differ in several important respects, namely, in the universal presence of males in *Cypricercus*, the less well-developed caudal rami, and in the fact that the genus *Strandesia*, is, so far as is now known, confined to the southern regions.

CYPRICERCUS EPISPHAENA G. W. Müller

Figure 14, *s*

Cypricercus episphaena G. W. MÜLLER, Deutsch. Südp. Exped., vol. 10, p. 155, 1908.
Strandesia episphaena G. W. MÜLLER, Das Tierreich, vol. 31, p. 188, 1912.

Specific characters.—FEMALE: Height about half the length, highest in the anterior third of the valves. Dorsal margin slightly rounded and sloping gently to posterior extremity. Anterior extremity broadly rounded; posterior extremity tapering to a rounded point, which is terminated by a well-developed spine located about three-sevenths the height of the shell from the ventral margin. Ventral margin weakly S-shaped and convex. Left valve without posterior spine. Second antennae with natatory setae which do not completely reach the tips of the terminal claws. First leg with a terminal claw that is short and poorly developed. Furca curved, the dorsal margin with seven or eight groups of fine spines. Terminal claw about one-third the length of the ramus. Terminal seta about half the length of the terminal claw. Length 1.22 mm.; height 0.53 mm.

MALE: Unknown.

Material examined.—Nineteen specimens were taken from a reservoir in Pirissinunga, São Paulo by Dr. Kleerekoper (March).

Reported distribution.—South Africa (Müller, 1908).

CYPRICERCUS ROTUNDUS, new species

Figure 14, *t–w*

Specific characters.—FEMALE: Shell shape similar to *C. fuscatus* although not as large. Height of shell distinctly greater than half

the length; highest slightly anterior to the middle. Dorsal margin arched, with an indistinct angle at the highest point. Both ends broadly rounded, the anterior extremity slightly more so than the posterior. Ventral margin convex and slightly sinuated. Surface of valves smooth, with a few fine hairs and with irregular polygonal markings here and there on the valves. Second antennae with natatory setae, which reach slightly beyond the tips of the terminal claws. First leg with a long, well-developed terminal claw, a distinctly divided next-to-last segment, and heavy bristles along the inner margin. Second leg with a slightly bent terminal beak and a short, reflexed seta. Bristles along the inner margin not very well developed. Furca long and slender. Dorsal margin with five groups of fine hairs. Dorsal seta short and removed from the base of the subterminal claw by the thickness of the base of the claw. Terminal seta lacking a little of being half the length of the terminal claw. Subterminal claw about two-thirds the length of the terminal claw. Both claws finely haired. Length 1.08 mm.; height 0.63 mm.

MALE: Unknown.

Holotype.—U.S.N.M. No. 83006.

Type locality.—Eight specimens were collected by Dr. Kleerekoper in a lakelet in the state of Rio de Janeiro (October).

Genus CYPRETTA Vávra

Cypretta VÁVRA, Mitt. Mus. Hamburg, vol. 12, p. 6, 1895.—G. W. MÜLLER, Abh. Senckenb. Ges., vol. 21, p. 283, 1898.—FURTOS, Amer. Midl. Nat., vol. 17, p. 493, 1936.

Very small forms, never longer than 1 mm. Very tumid when viewed from above and high and broadly arched when viewed from the side. Anterior margin of each valve with a row of prominent, radiating striata. Natatory setae of second antennae well developed as a rule. Furcal rami poorly developed with the claws reduced to setalike structures. Terminal and dorsal setae often lacking.

CYPRETTA COSTATA G. W. Müller

FIGURE 14, *z*

Cypretta costata, G. W. MÜLLER, Abh. Senckenb. Ges., vol. 21, p. 283, 1898.

Specific characters.—FEMALE: Shell very high; height equal to almost five-sixths the length and highest in the middle. Dorsal margin highly arched, with a trace of a blunt angle at the highest point. Both extremities broadly rounded. Anterior margin of valves with a series of very prominent radiating septa. Viewed from above, very tumid, the breadth equaling four-fifths of the length. Natatory setae of second antennae extend beyond the tips of the terminal claws. Furcal ramae with terminal setae missing. Ramus slightly curved. Ter-

minal claw equal to about three fourths the length of the ramus and notably curved. Dorsal setae very short and poorly developed. Length 0.66 mm.; height 0.53 mm.

MALE: Unknown.

Material examined.—One specimen was collected by Dr. Kleerekoper from a temporary pool on grassland near Porto Alegre, Rio Grande do Sul (September).

Reported distribution.—Madagascar (Müller, 1898); Santarém, Brazil (Tressler, unpublished).

LITERATURE CITED

BAIRD, WILLIAM.

1859. Description of some new Recent Entomostraca from Nagpur, collected by the Rev. S. Hislop. Proc. Zool. Soc. London, vol. 27, pp. 231–234.

1862. Description of some new species of entomostracous Crustacea. Ann. Mag. Nat. Hist., ser. 3, vol. 10, pp. 1–6.

BRADY, GEORGE STEWARDSON.

1886. Notes on Entomostraca collected by Mr. A. Haly in Ceylon. Journ. Linn. Soc. London, vol. 19, pp. 293–317.

CLAUS, CARL.

1892. Beiträge zur Kenntnis der Süsswasser-Ostracoden. Arb. Zool. Inst. Wien, vol. 10, pp. 147–216.

DADAY, EUGENE.

1898. Mikroskopische Süsswasserthiere aus Ceylon. Termész. Füz., vol. 21 (Suppl.), 123 pp.

1905. Untersuchungen über die Süsswasser-Mikrofauna Paraguys: Zoology. vol. 18, pt. 44, 374 pp., 23 pls., 2 figs.

1911. Eine neue *Cypris*-Art aus Brasilien. Zool. Anz., vol. 38, pp. 337–339.

EVENSON, C. D.

1942. The ostracod *Chlamydotheca unispinosa* reported from the United States. Anat. Rec., Abstract, vol. 84, pp. 537–538.

FURTOS, NORMA C.

1933. The Ostracoda of Ohio. Ohio Biol. Surv. Bull. 29, vol. 5, No. 6, pp. 413–524.

1936. On the ostracods from the cenotes of Yucatan and vicinity. Carnegie Inst. Washington Publ. 457, pp. 89–115.

HERRICK, CLARENCE LUTHER.

1887. Contribution to the fauna of the Gulf of Mexico and the South. List of fresh-water and marine Crustacea of Alabama with descriptions of the new species and synoptic keys for identification. Mem. Denison Sci. Assoc., vol. 1, No. 1, pp. 1–56.

HOFF, CLAYTON C.

1944. The origin of the Nearctic fresh-water ostracods. Ecology, vol. 25, pp. 369–372.

KLIE, W.

1939a. Süsswasserostracoden aus Nordostbrasilien. I. Zool. Anz., vol. 128, pp. 84–91.

1939b. Süsswasserostracoden aus Nordostbrasilien. II. Zool. Anz., vol. 128, pp. 152–159.

1939c. Süsswasserostracoden aus Nordostbrasilien. III. Zool. Anz., vol. 128, pp. 316–320.

1940a. Süsswasserostracoden aus Nordostbrasilien. IV. Zool. Anz., vol. 129, pp. 113–120.

1940b. Süsswasserostracoden aus Nordostbrasilien. V. Zool. Anz., vol. 129, pp. 201–206.

1940c. Süsswasserostracoden aus Nordostbrasilien. VI. Zool. Anz., vol. 130, pp. 59–73.

MÜLLER, G. W.

1898. Die Ostracoden. (Wiss. Ergebn. Reisen in Madagaskar und Ostafrika.) Abh. Senckenb. Ges. Frankfurt, vol. 21, pp. 257–296.

1908. Die Ostracoden. Deutsch. Südpol.-Exped., vol. 10: Zoology, vol. 2, pp. 51–181, 10 pls., 45 figs.

1912. Ostracoda. Das Tierreich, vol. 31, 434 pp., 92 figs.

SARS, GEORG OSSIAN.

1901. Contributions to the knowledge of the fresh-water Entomostraca of South America. Copepoda, Ostracoda. Arch. Naturv. Christiania, vol. 24, No. 1, 52 pp., 8 pls.

1903. Freshwater Entomostraca from China and Sumatra. Arch. Naturv. Christiania, vol. 25, No. 8, 44 pp., 4 pls.

1928. An account of the Crustacea of Norway, vol. 9, pts. 15, 16, Ostracoda, pp. 241–277.

TRESSLER, WILLIS L.

1937. Woltereck-Wallacia Expedition. Ostracoda. Inter. Rev. ges. Hydrob. Hydrog., vol. 34, pts. 3–5, pp. 188–207.

1947. A check list of the known species of North American fresh-water Ostracoda. Amer. Midl. Nat., vol. 38, pt. 3, pp. 698–707.

---- Ostracoda from northern Brazil. (In preparation.)

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